

Enhanced Hearing Protection for High Noise Environments

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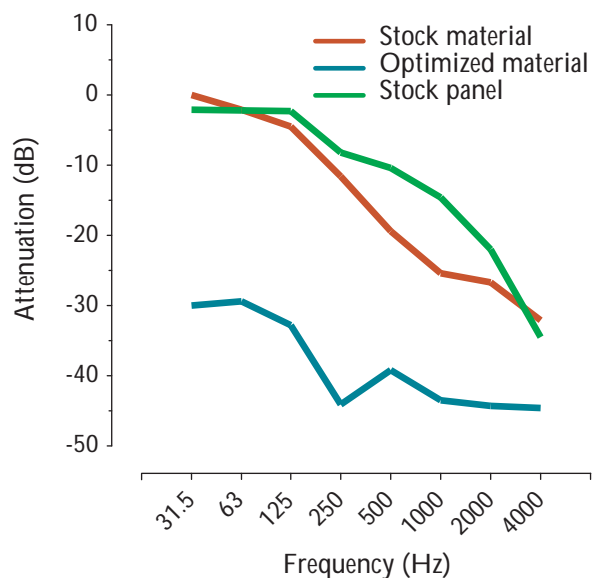
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Currently available hearing protection devices are sometimes inadequate in very high noise operational environments. A new sound-attenuating technology has been developed and patented at this laboratory and is currently undergoing engineering development.

The objectives of this project are to determine the optimal engineering parameters underlying the new technology and apply them to hearing protectors and sound-attenuating materials, to provide prototype models for formal test and evaluation, and to design specifications for eventual manufacture.

Sequential and quasi-concurrent engineering approaches are being pursued. During FY97, efforts centered on resolving the problem of attaining good noise attenuation in hearing protectors while preserving comfort for the user and simplicity of fabrication for the manufacturer. New materials were evaluated as they became available, and new ear-seal

designs were fabricated and evaluated. In late FY97 and early FY98, hearing protectors based on the new technology were produced in limited supply for field testing. In concurrent efforts, we are working toward applying the new technology to large surface areas in sheets and with a spray-on method that might be used to retrofit troublesome noise sources. To these latter ends, special facilities were constructed in FY97 and development efforts were begun. Initial attempts at sheet fabrication will be submitted to an independent test laboratory for validation testing. FY98 will see further development and refinement of the hearing protectors based on user feedback and formal evaluations, as well as an acceleration of the large-surface effort (see Figure). Research into spray-on applications is slated to begin in late FY98 and continue during FY99. Testing during this period will involve human models and will include noise attenuation measurements, user acceptance surveys, and speech intelligibility testing.



Sound attenuation by stock and optimized aircraft interior-panel epoxies. Lower values are better.



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